OHIO'S ENGINEERING FIRSTS

By GEORGE S. BONN

5. Electrical Industry

AGAIN Ohio rings the bell. However, this time it happens to be an electric one. With several of the world's greatest inventors born here, several of the world's largest manufacturing plants located here, and the world's most powerful radio station broadcasting from within its borders, Ohio can safely stare anybody down who blows about his state's electrical prowess.

Edison, Brush, Lamme, Packard—just an important few of Ohio's important inventors. Radios are made in Cincinnati; refrigerators in Cincinnati, Dayton, and Mansfield; light bulbs in Cleveland and Warren; motors and generators in lots of places. Some of the earliest broadcasting, both experimental and commercial, was done in Ohio; now WLW in Cincinnati with its 500,000 watts is the most powerful station operating.

Radio

A lot of the early history of radio is hazy, even in the minds of those who made it. Commercial broadcasting got its start in the very early 1920's but who was first is difficult to determine. There were a great many people experimenting; one of Ohio State's early wireless sets played a part in the 1913 flood here in Columbus. However, the University station began real broadcasting in June, 1922, with the call letters WEAO. (Somebody soon said that WEAO stood for "Where Education Advances Ohio"; in 1925 they thought it meant "We Educate All Ohio"; it was a good thing that the letters were changed to WOSU on the tenth anniversary of the station or we would be still thinking up significant phrases.)

It was in the spring of 1922 that the first "commercial" broadcasting was done in the state (anyhow, Columbus) and the University band did it. A spring carnival was being held on the old Ohio field, where the Education Building and the University High School are now located. All the fraternities and sororities had little tent booths wherein one went to try his or her skill at all sorts of games. The University band was there, too, making a joyful noise for the benefit of the various concessions. One of the engineering fraternities also had a tent, but it was strictly scientific; a sign outside advertised that for the small sum of 10 cents (or some such amount) one could come inside, put on a pair of earphones, and hear KDKA all the way from Pittsburgh. (KDKA was, perhaps, the first broadcasting station in the country.)

The tent was full and the operator in charge of the apparatus tried for KDKA; but he couldn't get it. Static was bad and reception worse, but the boys didn't want to disappoint so many customers. So, a couple of them appeased the crowd while a couple more rushed around to the old army barracks, located in what is now the "engineering quadrangle." There, with the help and equipment of the ROTC signal corps, they set up a sending outfit. Fifteen pieces from the band were recruited under the direction of Elvin F. Donaldson (now professor in the departments of economics and business organization here at Ohio State); they sat before the microphone in a small room in the barracks and played. One of the fellows "announced" that the music of the orchestra was coming direct from KDKA in Pittsburgh; the music was broadcast to the tent over at the carnival and the audience went home undoubtedly quite satisfied. Science is indeed wonderful.

Then there was the Precision Equipment Company down in Cincinnati, one of the early commercial producers of radios. We, editorially speaking, had one of their sets known as an Ace Type V, which worked splendidly until we tried to make it operate on short waves, too. The Precision Equipment Company gradually became the Crosley Radio Corporation which has since spread all over the map.

I. E. S. Lamps

A very recent beneficial innovation in the lamp industry had its start here in Ohio, and perhaps right here on our own campus. Back in 1933 when the Industrial and School Lighting Committee of the Illumination Engineering Society was looking for something worth while to do, Professor Caldwell, a member of the committee and of the department of electrical engineering here at Ohio State, suggested that something be done about student desk lighting. He had been conducting a lighting survey of students' rooms using a light meter to get the intensity of illumination in various parts of the room and particularly on the desk. He found the lighting arrangements very bad with very frequently just a bright spot of light on the desk and darkness all around.

The committee thought it was a good idea, so they had forms made to send to various colleges all over the country to get information on conditions of lighting in students' rooms. The same trouble was found all over. Accordingly, specifications were developed for a lamp that would serve the needs of the students in the most efficient way. To Mr. Little of the Electrical Testing Laboratories of New York and Professor Dates of Case School of Applied Science in Cleveland must go the

credit for designing the lamp. It was developed at a time when both electrical equipment manufacturers and power producers needed more business, so they began an intensive advertising campaign using the slogan "Better Light, Better Sight," and sold a million of the now familiar I. E. S. indirect-lighting lamps in 17 months. The Illuminating Engineering Society got no money for its work, but gave the specifications to any producer who wanted them so long as he put the little I. E. S. tag on the lamp. About forty different manufacturers are making the lamps and putting on the little tag. Recently, there have been imitations, cheaper to be sure, but also more cheaply made; these do not have the tag, but the society doesn't mind so very much since it has accomplished its original purpose of getting better lamps on the market. Now you see them everywhere.

Incidentally, another "first" might be mentioned. Professor Caldwell and Professor Emeritus Boyd as members of the Athletic Board years back built the first fence around the football field; and a board fence at that.

Edison

To say anything about Thomas Alva Edison that everybody doesn't know already is almost impossible, but there are a few things that are particularly interesting and worth the repetition. You will remember that he was born February 11, 1847, in the little town of Milan, up near Norwalk and Sandusky, but that didn't make him a particularly outstanding youngster. Henry Howe tells us that a citizen of Milan remembered Edison as a child, too young to read or spell, seated on the ground on the village green grasping a piece of chalk and copying on a board the letters of a store sign near by. Howe said "it was a bright beginning; an ordinary child would not have done such a thing." But the villagers were not so impressed with his brilliance when he sat on a nest of goose eggs in an attempt at human incubation. He was, furthermore, he said himself, "usually at the foot of the class."

When Thomas was 10 years old the family moved to Port Huron, Michigan, where he continued his "scientific" experiments by filling his father's chore boy with seidlitz powders in an attempt to generate enough gas in his stomach to enable him to rise like a balloon. Needless to say, the neighbors were hardly impressed with that experiment; they probably sympathized with the chore boy, instead.

You will remember how he became a newsboy on the Grand Trunk Railway at the age of 13, and how he set a baggage car on fire while he was "experimenting" with some phosphorus; the cuffing about the ears he received for his trouble was a direct cause of his becoming deaf later in life. That this deafness didn't bother him much can be seen when he first tried out an acousticon. He could hear quite well with it he said but he didn't want to use it; he explained, "My impaired hearing is one of my greatest assets. It enables me to concentrate under all conditions and saves my time. Because of the necessity of shouting at me, others condense their conversation."

His first patent was issued in 1868; the talking machine came in 1877; the incandescent lamp came in 1879; the motion picture machine came in 1893; altogether, he had more than 1150 patents issued to him. But, he worked hard; he kept working, too; during three weeks in September of 1912 he worked 312 hours, an average of 104 hours per week. There is talk now of a 30-hour week. The answer is that Edison really enjoyed working and doing things. No wonder he was chosen one of America's 12 greatest inventors.

Brush

Charles F. Brush, another of Ohio's great electrical wizards, was born in Euclid near Cleveland just two years after Edison. He lived on a farm most of his boyhood and spent his time "experimenting" with all sorts of things, chemicals, magnets, telescopes, batteries, microscopes, and even gas lights. He went to the University of Michigan where he graduated in 1869 as a mining engineer. He came back to Cleveland and set up a chemical lab where he became a good analyst. He spent a little time in the iron business, too, before he actually started to invent and perfect his devices.

Through Mr. George W. Stockly he became associated with the Cleveland Telegraph Supply Company where he made his inventions and produced some of them commercially. He brought out lamps and generators before he was 28 years old. In 1878 the Telegraph Supply Company did less than $50,000 worth of business; in 1883 the company did about $2,000,000 worth. It was in 1880 that the name became the Brush Electric Company, which was quite proper since Brush was responsible for most of the business.

Brush's major contributions have been the arc lamp and a dynamo-electric machine, but there have been numerous other devices developed by him. Henry Howe calls him a "benefactor beyond the power of expression." Western Reserve University gave him a doctor's degree.

To be sure Ohio has produced other important men, but they didn't have the effect on the whole world that these have had. In 1933 Ohio did $99,308,000 worth of electrical business. To go into more detail would take too much time and space, but Ohio's electrical industries and electrical developments are worthy of perhaps several articles.

She (awkward dancer)—This dance floor is certainly slippery!

He—It isn't the dance floor, I just had my shoes shined.

Farmer—Say, I've been finding a lot of dead crows in the fields lately.

Ditto—Yep, Joe Johnson down the road made a scarecrow out of the duds his boy brought back from college and the birds been laughin' themselves to death.